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ABSTRACT

This paper reports upon the evaluation and implementation of a 30-item Likert-type rating scale for teachers to use in assessing children's behaviors within preschool classrooms. The Preschool Observation Scale (POS) was developed to evaluate programs of the Mt. Druitt Early Childhood Project, North Ryde, Australia. Items were constructed on the program-related, socio-emotional variables of creativity, dependency, language, prosocial behaviors, need achievement and anxiety. Reliability and construct validity tests of the scale are described. Inter-rater reliability coefficient estimates, stability coefficient estimates, and factor analyses of the pilot test indicate that the instrument has construct validity and is reliable. Use of the instrument in the large scale 1977 assessment of the classroom behavior of 259 children attending 4 project preschools is described and results are reported and discussed. Language, need-achievement, anxiety and prosocial factors were conceptually consistent in ratings across all 4 sites. Dependence and creativity did not have the same consistency. Need achievement correlated positively with the language dimension and negatively with anxiety type behaviors. Inter-rater reliability decreased as time between ratings increased. The paper suggests that the POS is a useful device for monitoring selected child behaviors. Directions for further research are indicated. (RH)

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DISCUSSION PAPER

Teachers' Ratings of

Preschool Children's Behaviours

John Metham

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John Braithwaite

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Evaluation of program effectiveness is one of the more contentious areas in early childhood education. Many evaluation studies have been criticised for their reliance upon standardised achievement tests as the sole determiners of program success. Other critics claim that evaluators fail to consider the affective outcomes stressed by the majority of preschool programs because of the evaluator's reliance on objective and achievement measures. To overcome some of the criticisms levelled at the evaluation models followed, the Mt. Druitt Early Childhood Project attempts to incorporate aspects from the more traditional evaluation approaches and incorporate ideas being generated by writers stressing a developmental approach to evaluation.

This paper reports upon the implementation and evaluation of a teachers' rating scale of preschool children's behaviours within preschool classrooms. The rating instrument is comparatively easy for teachers to complete and provides valuable information for teachers about selected aspects of preschool children's behaviours. The teachers' ratings provide a valuable source of information in our attempts to evaluate the effects generated by the different programs within the Project.

John Braithwaite

Teachers' Ratings of Preschool Children's Behaviours
Using the Preschool Observation Schedule (POS)

INTRODUCTION

This report on the teachers' ratings of preschool children's behaviours stems from a major evaluation goal of the Mt. Druitt Early Childhood Project.* This goal states that the Project intends

> to specify overall, and separately for different kinds of children, the short-term and long-term, intended and unintended effects on pupils, family and school of the five programs instigated by the Project.

To partially achieve this goal, changes in children's socio-emotional development have to be evaluated. Specifically, information is needed on the following variables from the socio-emotional domain: creativity, dependency, language, pro-social behaviours, need achievement and anxiety. One way to assess such change is through the use of teachers' ratings of children's behaviours. As Kamii (1971) points out, the teacher is in possession of this developmental knowledge and perhaps the person best suited to evaluate the children's socio-emotional behaviours within the classrooms.

Despite criticism by Bernstein and Brandis (1970), the use of teachers' ratings in the present study appears legitimate since this practice enjoys a wide vogue in educational data gathering. For example, batteries of rating scales developed by Stanford, Adkins, Miller, Cobb and Steward (1943); Walker (1967); Keogh and Smith (1970); Tobiessen, Duckworth and Conrad (1971); Bryan and McGrady (1972); Ingleby and Cooper (1974); Schaefer (1975); Flynn (1976); and Kohn (1977) are widely used in schools and in research studies.

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*The Project is concerned with the development and evaluation of early childhood programs for disadvantaged children in the Western suburbs of Sydney.

Apart from assessing developmental change the use of a rating schedule may enable the Project research personnel to study a school profile and generate predictions about possible behavioural developments. For example, it may be hypothesised that by the end of the third term most children will be exhibiting socially approved behaviour. An approach such as this enables further examination of deviant cases to be evaluated to determine if they are attributable to programmatic effects or to individual differences in children's development.

DEVELOPMENT OF THE INSTRUMENT

a) Introduction

In 1976 an extensive search of the relevant literature was made to find an appropriate instrument to assess change in children's socio-emotional behaviours as well as providing information to teachers on variables of interest to them. These variables included language. pro-social behaviours, anxiety, dependency, creativity and achievement. A number of standard rating scales such as the Banks Kindergarten Behavioural Index, Butler's Children Behaviour Questionnaire, the Stamp Behaviour Study Technique; the Myklebust Pupil Rating Scale and the Schaefer-Aaronson Behaviour Inventory were examined and discarded as being inappropriate for the specific needs of the present study.

Therefore, it was decided to design an instrument that would enable the Project's evaluation objectives to be achieved. In constructing the instrument the domains of interest were first identified then items written reflecting behaviours within these domains. Where necessary the list of behaviours was supplemented with items suggested by the literature search.

These items were behaviourally worded to increase reliability by forcing teachers to rate specified behaviours rather than construe, interpret and provide inferences about psychological attributes. Economy of time and effort as well as the codability of results were taken into consideration in the construction of the instrument.

A trial version was developed and given to teachers for comment. A number of in-service training courses featuring a variety of the different behaviours described in the instrument recorded on video-tape were shown to the teachers. This tape was used in the training sessions to enable agreement on the meaning of the items to be reached. Following discussion in these sessions the final format of the instrument was established. Titled the Preschool Observation Scale, it is a 30-item Likert-type rating scale, with the scale ranging from 1 to 5. The instrument is included in the Appendix A together with the acompanying descriptors (Appendix B).

b) Procedure

The instrument was piloted in the months of August, November and December, 1976 by these teachers in order to ascertain the reliability and construct validity of the instrument and to determine its feasibility for use. Altogether there were eight teachers working in team teaching situations in four independent preschool sites.*

At each site, the maximum number of children enrolled was eighty: forty in the morning session and forty in the afternoon session.

* Throughout this paper the terms "site" and "program" are used synonymously.

In August, the teachers were requested to rate all the children in their preschool in the following pattern: one teacher would rate the first child on the roll, the other teacher would rate the second child on the roll, and both teachers would rate the third child on the roll independently. The pattern was to be repeated until all the children were rated. Having the teachers independently rate the third child on the roll enabled an inter-rater reliability coefficient estimate to be calculated.

In November this pattern was repeated but at a different starting point such that both teachers rated the second child independently. This allowed the determination of an inter-rater reliability coefficient estimate on different children to be performed.

The pattern was repeated for December but again the starting point was changed such that both teachers rated the first child independently.

c) Data Analysis

The purpose of the 1976 pilot was to ascertain the reliability and construct validity of the instrument and hence its usefulness for the evaluation of change in preschool children's behaviours.

The pattern of data-gathering prescribed enabled the inter-rater reliability coefficient estimate (which is defined as the correlation based on ratings made by different raters at the same time on the same subject) to be calculated through an application of Ebel's (1951) formula:

$$r_1 = \frac{M\bar{x} - M}{M\bar{x} + (k-1)M}$$

where r_1 = the reliability of estimates;

M = the mean square of error;

$M\bar{x}$ = the mean square for persons;

and k = the number of raters.

This formula enables reliability estimates to be obtained from analysis of variance computations based on teacher ratings. These computations were applied to the data gathered in the months of August, November and December. Medley and Mitzel (1963) consider that in estimating the reliability estimates appropriate in such situations, the most efficient method is an analysis of variance. They argue that a single correlation can be calculated from analysis of variance on a set of data collected according to a Repeated Measures design. This single coefficient combines all of the information in the raters' independent assessment of each of the subjects.

As well, the pattern of data-gathering also enables the stability coefficient estimate, defined as the correlation between scores based on rating made by the same rater at different times on the same subject, to be calculated.

d) Results of the 1976 Pilot

Table 1 illustrates the coefficient estimates of observer agreement across the four sites for each of the three months. Inspection of Table 1 reveals that nine estimates are above the arbitrarily determined

criterion level of .70. The three estimates below the criterion level are not peculiar to any one site but are distributed across the different sets of raters. The general trend of the results suggests that the teachers can use the instrument with a workable degree of consensus.

Table 1 Inter-rater Reliability Coefficient Estimates in 1976 Across Four Programs

Month	Program 1	Program 2	Program 3	Program 4
August	0.81	0.86	0.84	0.67
November	0.73	0.81	0.77	0.76
December	0.54	0.68	0.84	0.84

Table 2 The Stability Coefficient Estimates for each Project Teacher Rating Between the Months of August and December 1976 Across Four Programs

Program 1		Program 2		Program 3		Program 4	
Teacher J:	.77	Teacher C:	.86	Teacher E:	.78	Teacher G:	.80
Teacher K:	.75	Teacher D:	.82	Teacher F:	.83	Teacher H:	.74

As well, the stability coefficient estimates are presented for each of the Project teachers between the months of August and December in Table 2. All the estimates are above the required minimum criterion level of .70 established earlier. This pattern indicates that all the Project teachers can use the instrument consistently.

The next statistical procedure is an application of a Factor Analysis to the data gathered in each month to detect whether the items cluster together to form the predetermined dimensions. The factors to emerge are detailed in Table 3.

From an inspection of Table (3) it is apparent that the hypothesised dimensions do form as predicted on the various factors.

Four factors emerge. On Factor 1 which is bimodal, the dimensions of *Language* and *need-Achievement* correlate together with a positive valence. In the opposite direction, the *Anxiety* dimension is represented. The interpretation made of this pattern is that part of being competent in the preschool for a child requires a fair command of language and confidence to initiate interactions with either other people in the preschool or the preschool materials. *Anxiety* behaviour inhibits an effective exploration and mastery of the preschool environment. So the first factor to emerge was a *Preschool Competency* dimension consisting of a *Language* component and a *need-Achievement* component. At the negative pole of this factor is an *Anxiety*-type component which inhibits an effective and successful mastery over the preschool environment.

Table 3 Factor Analyses of the Preschool Observation Schedule for August, November and December, 1976 Using a Varimax-Orthogonal Rotation*

	Items	Factor Loading August	November	December
Factor I	10. makes explanations	.82	.85	.82
	26. has a wide vocabulary	.79	.82	.74
	3. extends upon language situations	.78	.83	.82
	4. answers questions appropriately	.78	.76	.81
	19. asks questions	.70	.74	.68
	23. approaches tasks with assurance	.67		.71
	8. works to complete an activity	.67		
	9. expresses interest in set tasks	.64		.58
	11. plans and prepares for a task	.64	.56	.50
	6. attempts routine tasks independently	.62	.63	
	15. participates in group activities	.61		.62
	20. initiates new activities without assistance	.57	.64	.62
	13. talks about his/her treasures		.55	.54
	22. initiates interaction with other children		.57	.63
	16. wanders from one activity to another without completing any activity	-.57		
	17. withdraws when approached by an adult		-.53	-.64
	30. needs reassurance when attempting task		-.59	
	1. becomes flustered in group situations		-.65	-.66
Factor II	28. follows classroom rules and procedures	.73	.85	.79
	27. waits turns and shares materials	.64	.80	.76
	14. fights with other children	-.75	-.78	-.75
	5. disrupts activities	-.76	-.81	-.79
	24. expresses dislike of activities	-.77	-.68	-.69
Factor III	7. adopts varied role plays	.77	.63	.72
	2. becomes involved in fantasy play	.76	.66	.71
	21. plays with structured materials in novel (original) ways	.65	.59	.67
	25. uses odds and ends in a variety of creative ways	.54	.65	.67
Factor IV	18. stays near the teacher and seeks physical contact	.70	.70	.57

*Only factor loadings above .50 or below -.50 are reported.

Factors II and III emerge as tight independent dimensions of *Prosocial* behaviour and *Creativity*, respectively.

Finally the dimension of *Dependency* fails to form an independent set. Only Item 18 ("stays near the teacher and seeks physical contact") consistently emerges as a statistically independent item. This result reflects the 'floating'quality of such dependency items as Item 29 ("makes unnecessary demands for assistance, recognition or attention") and Item 12 ("stays near or follows around another child") which is a phenomenon demonstrated in previous research (Emmerich, 1966).

Since all the relevant statistical analyses (inter-rater reliability coefficient estimates, stability coefficient estimates, factor analyses) offer support for the reliability and construct validity of the instrument, the instrument was used in the major evaluation in 1977.

THE 1977 MAJOR EVALUATION ADMINISTRATION AND PROCEDURES

a) Introduction

The evaluation of change in the socio-emotional domain of preschool children's behaviour through the use of teachers' ratings appeared a viable concern in light of the 1976 pilot. Since the reliability and construct validity of the instrument had been attested to in the previous year, the decision was made to have teachers use the instrument.

Table 4 Distribution of Subjects over Four Preschool Programs, 1977

	Program 1		Program 2		Program 3		Program 4	
	Session		Session		Session		Session	
	AM	PM	AM	PM	AM	PM	AM	PM
Boys	19	20	18	9	14	14	15	20
Girls	17	20	16	12	20	15	18	12
Total	36	40	34	21	34	29	33	32
Σ =	76		55		63		65	

Table 5 The Pattern of Data Collection for Two Raters in 1977

Month:	March	April	July	August	November	December
Group:	X	Y	Z	X	Y	Z

b) Administration

The same teachers remained in the schools through 1977 except for teacher E at site 3 who transferred and was replaced by teacher L. On entry, teacher L was given similar training (as other teachers) in the use and purpose of the instrument.

The suggestion was also made that the 8 teacher aides be requested to rate the children as a further inter-rater reliability check and since they were agreeable they also had a similar training course.

A new cohort of children had entered the preschools in 1977. The population of 259 children was all the children attending the four preschools involved in the Project. The distribution of the population across the four sites is shown in Table (4).

The instructions were formalised for the administration of the POS ratings and are detailed hereunder.

> The POS will be completed on every child in the months of March and April, July and August, November and December. This means we shall have six rating forms on each child over the year, giving us a continuing record on all children's progress.
>
> The forms will be completed in the last two weeks of each month. Teacher A completes a form for the first child on the roll, teacher B completes a form for the second child on the roll, and both teachers A and B complete a form each for child C independently.
>
> Overall, forms on six children are to be completed each day by each teacher, three for the morning session and three for the afternoon session.
>
> If the child is absent simply go to the next name on the roll, making sure that you catch up with the absentee later.

Make sure that the morning set of observations is kept in a separate pile to the afternoon set.

Please don't forget to put the child's name, month of observation on each rating sheet. Cross out the session which does not apply.

It is emphasised that we want your observations of the child's behaviour over the month; those behaviours which are most typical of the child. Though you may complete the form on six children each day, you are to take into account the children's behaviours over the month; not only those behaviours which you observed on the day of completing the form.

c) Procedures

During the year there were four sets of teachers using the instrument with two working conjointly at each site. The number of children per set for joint rating each month was approximately 20, ten selected at random from the morning session and ten selected at random from the afternoon session.

The pattern of data collection for two raters is illustrated in Table (5).

In March and August of 1977 the two teachers at each site rated every first child of 20 sets of triads. These 20 'first' children formed a group (X in Table 5). In April and November, the two teachers rated every second child in the 20 sets of triads. These 20 'second' children formed the next group (Y in Table 5). In July and December, the teachers rated every third child in the 20 sets of triads. These 20 'third' children formed the last group (Z in Table 5).

As well, the aides in the programs who also had the same training in the use of the rating scale as the teachers were requested to rate the target children in the months of April, August and December.

Results and Discussion of the 1977 Data

This section is presented in four areas, each dealing with a specific aspect of the psychometric data illustrated through the use of the POS. The areas are:

A) Report on the Inter-rater Reliability Coefficient Estimates;

B) Report on the Stability Coefficient Estimates;

C) Report on the Factor Analysis of the Teachers' Ratings;

D) Report on the Change in children's Behaviours over the year.

A) Report on the Inter-rater Reliability Coefficient Estimates

Employing the statistical techniques discussed earlier the inter-rater reliability coefficient estimates that emerged in 1977 are reported in the summary table (Table 6).

Table (6) indicates that Sites 2 and 4 consistently had inter-rater reliability coefficient estimates above the minimum desirable level of .70 for each of the six months. Site 3 also has consistently high estimates except for .64 in August. The only ratings causing concern are from Site 1 where four of the six estimates were below .70 criterion level. However, since the lowest estimate is .53 and the other three above .60, the decision was made to include the data gathered in these months from this site.

Table 6 Inter-rater Reliability Coefficient Estimates Obtained in 1977 using Two Independent Raters Across Four Programs for Six Months

	Months					
Program	March	April	July	August	November	December
1	.60	.68	.53	.71	.61	.85
2	.83	.73	.84	.84	.81	.80
3	.81	.85	.85	.64	.79	.74
4	.80	.72	.82	.81	.76	.85

Table 7 Inter-rater Reliability Coefficient Estimates Obtained in 1977 Using Four Independent Raters (Aides) Across Four Programs for Three Months

	Months		
Program	April	August	December
1	.80	.80	.68
2	.69	.82	.74
3	.60	.75	.77
4	.63	.81	.83

It was also mentioned in the Procedures section that the teacher aides were requested to rate the 'target' children and the estimates derived from these ratings are reported in Table (7).

The coefficients presented in Table (7) indicate that four raters can use the instrument at the same time on the same subject with a consistent level of agreement.

The above evidence attests that the ratings by both teachers and aides were consistent.

B) Report on the Stability Coefficient Estimates

Further, as another check on the reliable use of the instrument by teachers, the stability coefficient estimate is also determined. Table (8) reports the stability coefficient estimates derived from the ratings made by the teachers on the same subjects at different times during the year.

Based upon the pattern of stability coefficient estimates two arguments may be advanced. First, of the 24 estimates nineteen are above the recommended level. This provides adequate evidence for confidence in the same rater's reliable use of the instrument over time. Second, the pattern emerging indicates that the longer the time span between ratings, the lower the stability coefficient estimate. This generalisation was not true for Teacher H whose stability coefficient estimate increased over time.

Table 8 Stability Coefficient Estimates Obtained in 1977

Site	Teacher	March/April	March/July	March/December
1	J	.80	.70	.64
1	K	.70	.68	.27
2	C	.91	.87	.83
2	D	.82	.77	.38
3	F	.92	.89	.67
3	EL[(a)]	.89	.70	.76
4	G	.88	.76	.73
4	H	.82	.83	.84

(a) Teacher E transferred in April and Teacher L replaced her.

C) Report on the Factor Analysis

Six dimensions from the socio-emotional domain are included in POS. These dimensions are *Language, need-Achievement, Prosocial behaviours, Creativity, Anxiety and Dependency.* Each is considered in turn with regard to the cogency of their operational construct, any developmental patterns that may emerge and correlation with other dimensions.

Language: The five items nominated to indicate various aspects of children's *Language* development are: "answers questions appropriately"; "has a wide vocabulary"; "makes explanations"; "asks questions"; and "talks about his/her treasures".

All these behaviours consistently cluster together for each of the four sites over each of the six sampled months. As well, Item 3 ("extends upon language situations") is attached to this dimension. Originally nominated as an item that would indicate creativity, this behaviour is perceived by teachers as reflecting another aspect of language fluency. As an operational construct, the dimension to emerge is an internally consistent indicator of language performance.

The results of children's individual factor scores reflect a normally distributed range of language ability. Rather than being homogeneous, the individual differences in the rate of development are apparent to the preschool teachers. For example, some children are elaborating on language a great deal while others have little to say. However, over the year, across the four sites, the teachers perceived a gradual developmental mastery of language by the children. This change was gradual and no dramatic improvement in any one language item is common across the four sites by the end of the year.

The *Language* dimension correlates positively with *need-Achievement* and negatively with the *Anxiety* dimension. An interpretation of this result is elaborated in the section on *Anxiety*.

need-Achievement: The five items nominated for the dimension of *need-Achievement* are: "wanders from one activity to another without completing any activity"; "expresses interest in set tasks"; "plans and prepares for a task"; "works to complete an activity"; and "participates in group activities". As an operational construct, the *need-Achievement* dimension emerging from the Factor Analysis is conceptually consistent. All these behaviours, except one, consistently cluster together for each of the four sites over each of the six sampled months. The exception is item 15 ("participates in group activities") which tends to 'float' from one dimension to another. However, item 20 ("initiates new activities without assistance") which is regarded as a dependency behaviour, is perceived by the teachers to be attached to the *need-Achievement* set of behaviours. These itemised behaviours may be taken to be specific examples of the general definition of *need-Achievement* offered by Crandall, Katkovsky and Preston (1960).

Across all sites, the teachers rated a gradual mastery, by the children, of all the need-Achievement objectives. This change is gradual and no dramatic improvement in any one need-Achievement item is common across the four sites. Rather than all the children being rated high on any one need-Achievement behaviour, the individual differences in the rate of development are apparent in all the preschool centres. For example, some children could work to complete an activity on preschool entry while others wander from one activity to another without completing any activity.

The *need-Achievement* factor correlates positively with the *Language* dimension and negatively with *Anxiety* type behaviours. The latter point is interpreted in the *Anxiety* section.

Anxiety: When used as an operational construct, the dimension of *Anxiety* also reflects the same consistent cohesiveness across sites and over time. Four behaviours - "becomes flustered in group situations"; "withdraws when approached by an adult"; "needs reassurance when attempting tasks"; and "approaches tasks with assurance" - tend to group together consistently. The other predicted behaviour which does not load on this dimension is Item 22 ("initiates interaction with other children"). This pattern is supported by the findings of Iscoe and Cochran (1960). They explore the question whether there are any behavioural correlates connected with children's scores on the Manifest Anxiety Scale. Their results offer support for the belief that *Anxiety* is manifested by prominent observable behaviours.

The *Anxiety* dimension negatively correlates with the *Language* and *need-Achievement* factors. It is argued that anxiety prevents children from performing well in school. Such anxiety inhibits an effective exploration and mastery of the preschool environment. This interpretation is supported by the research findings of Castaneda (1956); Castaneda, Palermo and McCandless (1956); Sarason, Davidson, Lighthall and Waite (1958); Ruebusch (1963); Hill and Sarason (1966); Phillips (1968) and Hill (1972).

Prosocial Behaviour: The *Prosocial Behaviour* dimension emerging from the Factor Analysis is conceptually consistent. The five items measuring the *Prosocial* dimension are: "disrupts activities";

"fights with other children"; "expresses dislike of activities"; "waits turns and shares materials"; and "follows classroom rules and procedures". All these behaviours, except one, consistently group together at each of the four sites over the data collection period. The exception is item 24 ("expresses dislike of activities") which tends to 'float' to other dimensions. At the beginning of the Project teachers suggested this item's valence was loaded negatively. However, over the course of the Project some of the teachers came to feel that it was a positive behaviour by children as they expressed their dislike of certain activities.

One of the developmental trends to emerge is that few aggressive behaviours were observed by the Project teachers at any time during the year. This result is supported by the research findings of Bridges (1931); Green (1933); Darve (1934) and Jersild and Marley (1935).

Possible lines of future research are indicated by the suggestions made by Body (1955). He concludes that the important influences determining aggressive behaviours seem to be the more specific situational and environmental differences found in various preschools such as the equipment in the preschool, the teacher-child ratio, the teaching methods and the group structures. This interpretation is also supported by the findings of Mischel (1968) and Freidrich and Stein (1973). Other evaluation instruments used in the Project such as PROSE and video tapes may be utilized to explore these suggestions.

In relation to the other factors, the dimension of *Prosocial Behaviour* emerged from the Factor Analysis independently from any other dimensions. This finding is not supported by Sears, Whiting, Nowlis and Sears (1953): Sears, Maccoby and Levin (1957) and Beller (1959). They report a positive relationship between *Aggression* and *Dependency* which is not found in this study.

Dependency: As an operational construct, the dimension of *Dependency* fails to have the same coherency as the previous four dimensions. All the nominated behaviours ("makes unnecessary demands for assistance, recognition or attention"; "stays near or follows around another child"; "stays near the teacher and seeks physical contact"; "attempts routine tasks independently"; and "initiates new activities without assistance") scattered inconsistently over the other dimensions. The valence of 'stays near of follows around another child' also changed over the term of the Project. Originally regarded as a negative behaviour, some of the teachers came to perceive this behaviour as typifying friendship among children.

One assumption underlying the study was that certain specified behaviours would cluster together to form a meaningful, generalised personality dimension. That such an assumption might be made about the dimension of *Dependency* is supported by the research findings of Beller (1955, 1957); Gewirtz (1956) and Beller and Haeberle (1959). This assumption is not supported by the present results which are in keeping with the conclusions reached by Emmerich (1966).

The results of the present study indicate that children tend to shift away from a passive dependency on adults towards a more active and assertive dependency of their peers. Shirley and Poyntz (1941); Heathers (1953)

and Stith and Connor (1962) all report a decline with age in dependency behaviours. Martin (1964) claims the relative frequency of dependency behaviours declines except for 'seeks positive attention'. As well, the relative frequencies of need-Achievement and friendship affiliation responses increase.

The dependency behaviours in the present study fail to correlate with any other factors. These dependency behaviours tend to shift randomly from one dimension to another without any consistent patterns emerging. This result is in conflict with a number of studies. Crandall, Preston and Rabson (1960) and D'Andrade (1966) found a correlation between *need-Achievement* and *Dependency*. Rosenthal (1967) and Ainsworth, Salter and Wittig (1969) found a relationship between *Anxiety* and *Dependency*.

However, as with most studies rating children's socio-emotional behaviours, the differences may in fact be an artifact of the items included in each instrument to measure *Dependency*. There does not appear to be any consistency in the number of items included purporting to measure particular domains. Neither is there agreement concerning the wording of the items.

Creativity: The dimension of *Creativity* also does not have the same coherency as the other dimensions. Only Items 2 and 7 ("adopts varied role play"; and "becomes involved in fantasy play") tend to cling together. The other behaviours ("plays with structured materials in novel ways"; and "uses odds and ends in a variety of ways") are rated by the teachers as belonging to task-oriented behaviours. It has already been mentioned that the behaviour "extends upon language situations" loaded on the *Language* dimension although it had been hypothesised as being in the *Creativity* dimension. It is also of interest to note that on occasions Item 7 ("becomes involved in fantasy play") assumed a negative value as it was perceived by teachers to be a form of day-dreaming.

A significant developmental pattern emerging from the results is that the individual items nominated as reflecting *Creativity* tend to be the ones most prone to a 'central tendency' effect across the four sites. None of these behaviours is rated above 4 at any of the preschools. These behaviours appear particularly difficult ones for the teachers to encourage.

The creativity behaviours tend to shift from one dimension to another without any consistent patterns emerging. It may be concluded that as an operational construct the dimension has been poorly conceptualised and difficult to evaluate, or these behaviours occur infrequently in preschool aged children, or that these behaviours are particularly resistant to change. Also, the same comment about the artifact of the items mentioned in the *Dependency* section is also relevant here.

D) Report on Change in Behaviours over Time

In an attempt to detect change in behaviour between March and December, 1977 the difference between the means for each item was explored (see Table 9).

During the teacher training sessions, a mean difference of .5 had been used as an arbitrary cut-off point to indicate significant differences between teacher ratings on individual items. This is an executive decision and to be consistent the same arbitrary level is used here to detect change over the year.

The following items all have a difference greater than .5 between March and December and are common across the four sites:

Table 9 Difference in Means for each Item By Sites between the Months of March and December, 1977

Site 1		Site 2		Site 3		Site 4	
Item	Difference	Item	Difference	Item	Difference	Item	Difference
11	1.3	21	1.1	11	1.5	21	1.2
27	1.1	25	.9	25	1.5	7	.9
8	1.1	20	.9	21	1.4	2	.8
23	1.0	27	.8	2	1.2	27	.7
9	1.0	28	.8	30	1.2	25	.7
20	1.0	30	.8	6	1.1	28	.7
6	.9	10	.8	7	1.1	11	.7
10	.9	9	.8	13	1.1	22	.7
13	.9	6	.8	20	1.1	20	.6
19	.9	22	.8	9	1.0	3	.6
30	.9	3	.7	23	.9	14	.6
28	.8	23	.7	19	.9	23	.5
4	.8	4	.7	3	.8	26	.5
3	.8	17	.7	4	.8	5	.5
15	.8	13	.6	22	.8	6	.5
1	.7	2	.6	26	.8	8	.5
22	.7	7	.6	27	.8	10	.5
26	.7	11	.6	28	.8	30	.4
5	.6	16	.6	1	.7	15	.4
29	.6	26	.5	8	.5	24	.4
14	.5	8	.5	15	.5	19	.4
7	.4	15	.5	10	.5	29	.4
16	.4	29	.4	16	.4	12	.3
24	.4	19	.4	17	.3	18	.3
25	.4	5	.3	29	.2	16	.3
17	.3	1	.3	12	.1	17	.3
19	.2	24	.3	5	.1	1	.2
2	0.0	18	.2	14	.1	9	.2
21	0.0	14	.2	24	0.0	13	.1
12	0.0	12	.1	18	0.0	4	0.0

3. extends upon language situations

6. attempts routine tasks independently

10. makes explanations

11. plans and prepares for a task

8. works to complete an activity

20. initiates new activities without assistance

22. initiates interaction with other children

23. approaches tasks with assurance

26. has a wide vocabulary

27. waits turns and shares materials

28. follows classroom rules and procedures.

This result suggests that preschool experience is particularly successful at encouraging language competency and positive work habits. There is also an indication that the children develop socially compliant and independent behaviours.

The following items all have a mean difference less than .5 between March and December and are common across the four sites:

12. stays near or follows around another child

24. expresses dislike of activities.

Both these behaviours changed in their valence during the year. Originally viewed as negative behaviours by some of the teachers, they later construed a different interpretation of their value. Item 12 came to reflect a form of friendship or attachment rather than dependency. Item 24, rather than being an aggressive act, is taken to be a legitimate and sensible thing for a child to express.

CONCLUSION

The study discusses the construction and evaluation of a teacher rating form for use with preschool aged children. The data presented in this paper suggest:

a) The instrument is useful as a monitoring device of selected child behaviours.

b) The inter-rater reliability data indicates that the scale can be consistently used by the same rater but that the stability coefficient estimate decreases the longer the time span between ratings.

c) Four of the six hypothesised dimensions consistently emerged from the ratings collected at four independent sites. The four dimensions are Language, need-Achievement, Anxiety and Prosocial behaviours. Two dimensions, Dependency and Creativity, failed to have the same consistency.

d) Language and need-Achievement behaviours ratings were normally distributed across the four sites. Over the year the teachers noted a gradual mastery by children of the various Language and need-Achievement objectives found in each preschool program.

e) Occurrence of aggressive behaviours decreased over the year; a fact supported by concurrent classroom observational data.

f) Children shifted away from a passive dependency on adults at the beginning of the year towards a more active and assertive attachment to their peers.

g) Creative behaviours on the part of children were not rated frequently by the teachers.

h) POS recorded changes in language and prosocial behaviours over the year. Changes in creative behaviours were not apparent to teachers.

As indicated in the general discussion section of this paper, there are some results conflicting with findings from other studies. In particular the Dependency and Creativity dimensions do not follow the same factor structures found in other studies. It was suggested that this result may be an artifact of the items used to rate these dimensions, by the different authors or it may reflect different behaviours by the children in this study. Either way the findings do merit further investigation.

The study does show the use of the POS instrument provides valuable feedback to teachers as it ensures they consider the behaviours of all the children in their class. Through using POS teachers have to consider children's developmental behaviours individually for at least some times during the year. As a result the quiet compliant child or the independent child who is often overlooked by teachers, can be assessed more objectively than hitherto. One further advantage gained from the use of POS over the year, is that teachers become more objective in detecting behaviour changes.

REFERENCES

Ainsworth, M., Salter, D. & Wittig, B. A. (1969), Attachment and exploratory behaviour of one-year-olds in a strange situation, In B. M. Foss (Ed.), Determinants of infant behavior. London: Methuen; New York: Wiley, Vol. IV, 111-136.

Beller, E. K. (1955), Dependency and independence in young children. Journal of Genetic Psychology, 87, 25-35.

Beller, E. K. (1957), Dependency and autonomous achievement-striving related to orality and anality in early childhood. Child Development, 28, 3, 287-315.

Beller, E. K. & Haeberle, A. W. (1959), Motivation and conflict in relation to phantasy response of young children. Paper presented at the 25th Anniversary meeting of the Society for Research in Child Development.

Beller, E. K. (1959), Exploratory studies of dependency, Trans. N.Y. Acad. Sci., Serial II, 21, 5, 414-426.

Bernstein, B. & Brandis, W. (1970), Social class, communication and control, In W. Brandis & D. Henderson (Eds.), Social class, language and communication: Language and primary socialization and education. Sociological Research Unit Monograph Series: Vol.1, London: Routledge & Kegan Paul.

Bridges, K.M. B. (1931), The social and emotional development of the preschool child. London: Routledge.

Brophy, J. E. & Good, T. L. (1974), Teacher-student relationships: Causes and consequences. New York: Holt, Rinehart & Winston.

Bryan, T. S. & McGrady, H. J. (1972), Use of a teacher rating scale, Journal of Learning Disabilities, 5, 199-206.

Castaneda, A. (1956), Effects of stress on complex learning and performance, Journal of Experimental Psychology, 52, 9-12.

Castaneda, A., Palermo, D. S. & McCandless, B. R. (1956), Complex learning and performance as a function of anxiety in children's task difficulty, Child Development, 27, 3, 327-331.

Crandall, V. J., Katkovsky, W. & Preston, A. (1960), A conceptual formulation of some research on children's achievement development, Child Development, 31, 787-797.

Crandall, V. J., Preston, A. & Rabson, A. (1960), Maternal reactions and the development of independence and achievement behavior in young children, Child Development, 31, 243-251.

D'Andrade, R. G. (1966), Sex differences and cultural institutions, In E. E. Maccoby (Ed.), The development of sex differences. Stanford, Calif.: Stanford University Press, 173-203.

Darve, H. C. (1934), An analysis of two hundred quarrels of preschool children, Child Development, 5, 139-157.

Ebel, R. L. (1951), Estimation of the reliability of ratings, Psychometrika, 16, 407-424.

Emmerich, W. (1966), Continuity and stability in early social development: II. Teacher ratings, Child Development, 37, 1, 17-27.

Flynn, T. M. (1976), Validation of preschool teachers' recall of children's behavior, Journal of Experimental Education, 46, 2, 46-51. 46-51.

Friedrich, L. K. & Stein, A. H. (1973), Aggression and prosocial television programs and the natural behavior of preschool children, Monographs of the Society for Research in Child Development, 38, No. 4.

Gewirtz, J. L. (1956), A factor analysis of some attention-seeking behaviors of young children, Child Development, 27, 1, 17-36.

Green, E. H. (1933), Group play and quarreling among preschool children, Child Development, 4, 302-307.

Heathers, G. (1953), Emotional dependence and independence in a physical threat situation, Child Development, 24, 3-4, 169-179.

Hill, K. T. (1972), Anxiety in the evaluative context, In W. W. Hartup (Ed.), The young child. Washington, D.C.: National Association for the Education of Young Children, Vol. II.

Hill, K. T. & Sarason, S. B. (1966), The relation of test anxiety and defensiveness to test and school performance over the elementary-school years: A further longitudinal study, Monographs of the Society for Research in Child Development, Serial No. 104, 31, No. 2, 1-75.

Ingleby, J. D. & Cooper, E. (1974), Research note: How teachers perceive first-year school children: Sex and ethnic differences, Sociology, 8, 463-473.

Iscoe, I. & Cochran, I. (1960), Some correlates of manifest anxiety in children, Journal of Consulting Psychology, 24, 97.

Jersild, A. T. & Marley, F. V. (1935), Conflicts between preschool children, Child Development Monographs, 21, New York: Bureau of Publications Teachers' College.

Kamii, C. K. (1971), Evaluation of learning in preschool education: Emotional, perceptual-motor and cognitive development, In B. S. Bloom (Ed.), Handbook on formative and summative evaluation of student learning. New York: McGraw-Hill.

Keogh, B. K. & Smith, C. E. (1970), Early identification of educationally high potential and high risk children, Journal of School Psychology, 8, 285-290.

Kohn, M. (1977), The Kohn Social Competence Scale and Kohn Symptom Checklist for the Preschool Child, Journal of Abnormal Child Psychology, 5, 3.

Martin, W. (1964), Singularity and stability of social behavior, In C. B. Stendler (Ed.), Readings in child behavior and development. New York: Harcourt, Brace.

Medley, D. M. & Mitzel, M. E. (1967), Measuring classroom behavior by systematic observation, In N. L. Gage (Ed.), Handbook of research on teaching. Chicago: Rand.

Mischel, W. (1968), Personality assessment. New York: Wiley.

Phillips, B. N. (1968), The nature of school anxiety and its relationship to children's school behaviors, Psychology in the Schools, 5, 195-204.

Rosenthal, M. K. (1967), The generalization of dependency behavior from mother to stranger, Journal of Child Psychology, 8, 117-133.

Ruebusch, B. K. (1963), Anxiety, In H. W. Stevenson (Ed.), Child Psychology. The Sixty-second yearbook of the National Society for the Study of Education. Chicago: University of Chicago Press, Part 1, 460-516.

Sanford, R. N., Adkins, M.M., Miller, R. B., Cobb, E. & Stewart, A.H. (1943), Physique, personality and scholarship: A cooperative study of school children, Monographs of the Society for Research in Child Development, Serial No. 34, 8, 1, 1-34.

Sarason, S. B., Davidson, K. S., Lighthall, F. F. & Waite, R. R. (1958), Classroom observation of high- and low-anxious children, Child Development, 29, 287-295.

Schaefer, E. S. (1975), Major relicated dimensions of adjustment and achievement: Cross-cultural, cross-sectional and longitudinal research, ERIC ED 115-390, 1-19.

Sears, R. R., Maccobby, E. E. & Levin, H. (1957), Patterns of child rearing. Evanston, Illinois: Row-Peterson.

Sears, R. R., Whiting, J. W. M., Nowlis, V. & Sears, P. S. (1953), Some child-rearing antecedents of aggression and dependency in young children, Genetic Psychological Monographs, 47, 135-236.

Shirley, M. & Poyntz, L. (1941), The influence of separation from the mother on children's emotional responses, Journal of Psychology, 12, 251-282.

Stith, M. & Connor, R. (1962), Dependency and helpfulness in young children, Child Development, 33, 15-20.

Tobiessen, J., Duckworth, B. & Conrad, W. G. (1971), Relationship between the Schenectady Kindergarten Rating Scale and the first-grade Achievement and Adjustment, Psychology in the Schools, 8, 29-36.

Walker, R. N. (1967), Some temperament traits in children as viewed by their peers, their teachers and themselves, Monographs of the Society for Research in Child Development, 114, 32, No. 6, 1-36.

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APPENDIX A.

MT. DRUITT EARLY CHILDHOOD PROJECT
PRESCHOOL OBSERVATION SCHEDULE (1976)

Name of student: _____ Month: _____
School: _____ Teacher: _____ AM/PM

Please describe as accurately as possible how the above student behaves by circling one of the five responses to each question. Base your response upon your personal observation and experience with the pupil OVER THE MONTH. Please do not confer with your team teacher about the pupil while completing this form. Notice that the NOT SURE response indicates that you are not certain that the response you made is valid.

		Very much like	Some-what like	Midd-ling	Very Little like	Not at all like	NOT SURE
1.	becomes flustered in group situations	5	4	3	2	1	x
2.	becomes involved in fantasy play	5	4	3	2	1	x
3.	extends upon language situations (fluency)	5	4	3	2	1	x
4.	answers questions appropriately	5	4	3	2	1	x
5.	disrupts activities	5	4	3	2	1	x
6.	attempts routine tasks independently	5	4	3	2	1	x
7.	adopts varied role plays	5	4	3	2	1	x
8.	works to complete an activity	5	4	3	2	1	x
9.	expresses interest in set tasks	5	4	3	2	1	x
10.	makes explanations	5	4	3	2	1	x
11.	plans and prepares for a task	5	4	3	2	1	x
12.	stays near or follows around another child	5	4	3	2	1	x
13.	talks about his/her treasures	5	4	3	2	1	x
14.	fights with other children	5	4	3	2	1	x
15.	participates in group activities	5	4	3	2	1	x
16.	wanders from one activity to another without completing any activity	5	4	3	2	1	x
17.	withdraws when approached by an adult	5	4	3	2	1	x
18.	stays near the teacher and seeks physical contact	5	4	3	2	1	x
19.	asks questions	5	4	3	2	1	x
20.	initiates new activities without assistance	5	4	3	2	1	x
21.	plays with structured materials in novel (original) ways	5	4	3	2	1	x
22.	initiates interaction with other children	5	4	3	2	1	x
23.	approaches tasks with assurance	5	4	3	2	1	x
24.	expresses dislike of activities	5	4	3	2	1	x
25.	uses odds and ends in a variety of creative ways	5	4	3	2	1	x
26.	has a wide vocabulary	5	4	3	2	1	x
27.	waits turns and shares materials	5	4	3	2	1	x
28.	follows classroom rules and procedures	5	4	3	2	1	x
29.	makes unnecessary demands for assistance, recognition or attention	5	4	3	2	1	x
30.	needs reassurance when attempting tasks	5	4	3	2	1	x

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APPENDIX B.

POS Item Descriptors

Item 1: becomes flustered in group situations. The child is intimidated by the group situation and becomes anxious. This is manifested by such behaviours as becoming tongue-tied, shy or flustered.

Item 2: becomes involved in fantasy play. A distinction is made here between role play and fantasy play. Role play is seen as such behaviours as playing mummy and daddy or doctors and nurses. The children are modelling themselves on some actual adult role. Fantasy play reflects an acting out of the child's imagination of a situation beyond what would usually be expected to be within the realm of the child's experience. For example, in one preschool paper streamers were hanging from the ceiling. One child was observed to develop this into an underwater scene with the streamers being both coral and seaweed. At different times the girl was an underwater diver, a shark, a crab, and various other sea creatures.

Item 3: extends upon language situations (fluency). This child is seen as the one who, say during a picture talk, will take over the subject and babble on about how when he went to the zoo he saw an elephant, and there was an elephant on TV last night, but the one on TV had different ears from the one on the zoo, and etcetera. This behaviour is considered positive in that the child is intelligibly extending upon the theme suggested by the object.

Item 4: answers questions appropriately. The child makes sense when answering a question. The answer is relevant and sensible.

Item 5: disrupts activities. The child deliberately runs into games, knocks over constructions and upsets play groups. The child is intent on aggression.

Item 6: attempts routine tasks independently. The child has organized himself. He can put on his own shoes, pack away, peel an orange or take himself to the toilet without assistance.

Item 7: adopts varied role plays. A role play is, for example, the girl who dresses the children in the dolls corner, makes the bed, sweeps the floor, washes the baby, puts the baby in the pram, has breakfast and takes the baby to the supermarket. An unusual role play is relative to the typical types of role play that are on-going in the preschool.

Item 8: works to complete an activity. This is the child who persists with a task even though it is difficult; who tries to follow an activity to a conclusion, and who will return to an activity even when interrupted.

Item 9: expresses interest in set tasks. The child verbally expresses an interest in an activity or by his actions displays interest. He might say, "Can I play that game?" or "May I use this toy?"

Item 10: makes explanations. The child can explain how a thing works, why a thing happens or when a thing happens. It is language work, looking at the question of how well or clearly a child can explain the world around her.

Item 11: plans and prepares for a task. This child reveals purpose behind what she does. She may collect all the materials she needs to accomplish a task, set them out in order of steps and systematically go about doing the job.

Item 12: stays near or follows around another child. This child will rely on another child, seek help or physical contact. She will behave in certain ways to gain the attention or approval of the other child.

Item 13: talks about his/her treasures. These are the children that enjoy talking about things they bring to school or things they might make.

Item 14: fights with other children. This is the child that seems to be constantly fighting, bickering or aggressing against other children.

Item 15: participates in group activities. The child joins in group activities with enthusiasm and needs little persuasion.

Item 16: wanders from one activity to another without completing any activity. This child seems apathetic, lacking any interest in the activities provided. The child tends to drift around, rarely seeing any task through to completion.

Item 17: withdraws when approached by an adult. This item attempts to indicate evidence of anxiety. The child tends to cry easily, shrinks within herself, shakes and reveals signs of nervousness.

relies on the teacher, seeks help or closeness or physcial contact. He will behave in certain ways to gain the attention or approval of the child.

Item 19: asks questions. Another language item, the child might ask the teacher why an elephant has a trunk, how did the elephant get its trunk, why don't we have trunks.

Item 20: initiates new activities without assistance. This child seeks out new tasks independently, actively exploring the environment, searching for fresh challenges.

Item 21: plays with structured materials in novel (original) ways. The example seen in one preschool reflecting this item was a boy who was set the task of finishing a puzzle. The theme of the puzzle was Fire with firemen, ladders, fire engines and hoses. Instead of replacing these pieces into their appropriate places, he stood all the pieces up and played out a drama involving the pieces.

Item 22: initiates interaction with other children. The child makes contact with other children, organizes games, makes suggestions and is seen as the leader.

Item 23: approaches tasks with assurance. This child is confident at accomplishing set activities.

Item 24: expresses dislike of activities. The child verbally criticizes an activity or expresses dislike of it. She might say, "I don't want to play that game" or "I don't like that toy" or "Do I have to?"

Item 25: uses odds and ends in a variety of ways. Rather than cutting out the same thing every time she is handed a pair of scissors and paper, she experiments along divergent lines. She uses materials in a variety of ways often with complex and elaborate detail.

Item 26: has a wide vocabulary. This child may not be as fluent as the child in Item 3 but it is apparent that she has an extensive range of words compared to other children.

Item 27: waits turns and shares materials. This child allows other children to use the same equipment, invites children to use the materials, doesn't argue or squabble over possessions, waits in turn and speaks in turn.

Item 28: follows classroom rules and procedures. This child knows the rules, has learnt the procedures, and attempts not to upset classroom routine. He walks in the classroom, respects "quiet corners" and puts back toys where and as he found them.

Item 29: makes unnecessary demands for assistance, recognition or attention. This child seeks out the teacher for trivial reasons. It is apparent that what he requires he can easily get for himself. The child is regarded as dependent when his help-seeking and question-asking behaviour did not appear to need the information or help per se but was essentially seeking attention.

Item 30: needs reassurance when attempting tasks. This child lacks confidence in attempting set tasks and needs persuasion and encouragement from the teacher.

APPENDIX C.

1977 Means for Each Item By Sites for Each Month

	March				April				July				August				November				December			
	Site				Site				Site				Site				Site				Site			
Item	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1.	2.6	3.3	2.3	2.3	2.2	3.3	2.2	2.4	2.5	3.3	2.4	2.4	2.2	2.9	2.4	2.2	1.9	3.1	2.3	2.1	1.9	3.0	1.8	2.1
2.	2.6	3.6	2.9	2.1	3.0	3.5	3.2	2.4	3.2	3.7	3.2	2.6	3.0	4.0	3.6	2.9	2.9	4.2	3.8	3.2	2.6	4.2	4.1	2.9
3.	3.6	3.5	3.1	3.1	4.1	3.5	3.1	3.3	3.9	3.9	3.2	3.5	4.2	4.0	3.1	3.8	4.3	3.9	3.5	4.1	4.4	4.2	3.9	3.7
4.	3.6	3.6	3.4	4.0	4.1	3.7	3.4	3.7	4.2	3.9	3.5	4.0	4.3	3.9	3.6	4.2	4.5	3.9	3.8	4.5	4.6	4.3	4.2	4.5
5.	2.5	2.5	1.8	2.1	2.1	2.1	1.6	1.9	2.3	2.3	2.2	1.7	2.3	2.5	1.9	1.8	2.1	2.6	1.9	1.5	1.9	2.2	1.7	1.6
6.	4.0	3.9	3.5	4.1	4.4	4.4	3.7	4.0	4.5	4.4	4.1	4.3	4.8	4.5	4.2	4.5	4.9	4.4	4.3	4.6	4.9	4.7	4.6	4.6
7.	2.6	2.8	2.3	2.2	2.8	2.9	2.5	2.4	3.0	3.1	3.0	2.8	2.7	3.4	3.0	3.2	2.7	3.3	3.2	3.4	2.2	3.4	3.4	3.1
8.	3.6	3.9	3.5	4.0	4.1	4.2	3.5	3.9	4.1	4.1	3.6	4.2	4.1	4.3	3.8	4.3	4.6	4.3	3.9	4.7	4.7	4.4	4.0	4.5
9.	3.7	3.4	3.0	4.1	4.2	3.5	3.0	3.8	4.2	3.5	3.4	4.1	4.3	3.4	3.7	4.3	4.7	4.1	3.8	4.7	4.7	4.2	4.0	4.3
10.	3.4	3.4	2.9	3.3	3.9	3.7	2.8	3.3	3.9	3.8	2.9	3.5	4.1	3.9	3.0	3.8	4.4	4.0	3.0	4.1	4.3	4.2	3.3	3.8
11.	3.6	3.2	2.3	2.0	4.3	3.2	2.6	3.1	4.4	3.7	3.2	3.3	4.7	3.7	3.4	3.6	4.9	3.7	3.6	3.8	4.9	3.8	3.8	3.7
12.	2.3	2.8	2.4	2.2	2.2	2.9	2.6	2.2	2.8	2.7	3.0	2.3	2.4	2.6	3.2	2.1	2.6	2.7	3.4	2.1	2.3	2.7	2.5	1.9
13.	2.8	3.3	2.6	3.2	3.4	3.1	2.6	3.3	3.5	3.4	3.0	3.5	3.7	3.3	3.1	3.6	3.9	3.4	3.6	4.1	3.7	3.9	3.7	3.8
14.	2.4	2.3	1.7	1.9	2.2	2.1	1.6	1.6	2.2	2.2	2.1	1.6	2.1	2.3	1.9	1.5	1.8	2.5	1.9	1.3	1.9	2.1	1.8	1.3
15.	3.9	3.7	3.4	3.8	4.3	3.9	3.1	3.6	4.2	4.1	3.5	4.0	4.3	4.3	3.5	4.3	4.7	4.1	3.7	4.5	4.7	4.2	3.9	4.2
16.	2.6	2.6	2.7	2.7	2.3	2.5	2.7	2.7	2.6	2.4	2.6	2.9	2.6	2.6	2.4	2.9	2.1	2.4	2.2	2.4	2.2	2.0	2.0	2.4
17.	2.1	2.1	1.8	1.8	2.0	2.2	2.0	2.0	1.9	2.1	2.1	1.8	1.7	1.8	2.0	1.7	1.5	2.1	2.0	1.5	1.8	1.8	1.5	1.6
18.	2.2	2.1	1.6	1.9	2.0	2.1	1.5	1.7	2.2	2.1	2.1	1.8	2.1	2.1	2.0	1.6	1.8	2.2	2.2	1.8	2.0	1.9	1.6	1.6
19.	3.1	3.3	2.9	2.7	3.6	3.4	2.8	2.7	3.7	3.5	2.9	3.0	3.8	3.6	3.1	3.1	4.1	3.6	3.3	3.5	4.0	3.7	3.5	3.1
20.	3.8	3.2	3.3	3.7	4.1	3.7	3.6	3.6	4.3	3.8	3.7	3.7	4.6	3.8	4.0	4.0	4.8	3.9	4.0	4.2	4.8	4.1	4.3	4.3
21.	2.9	2.9	2.2	2.7	2.8	3.4	2.4	2.7	2.8	3.6	3.0	3.1	2.8	3.7	3.2	3.5	2.6	3.8	3.4	3.2	2.9	4.0	3.7	3.9
22.	3.4	3.3	3.0	3.8	3.5	3.6	2.9	3.8	3.6	3.8	3.3	4.0	3.8	4.1	3.1	4.4	4.0	4.0	3.5	4.5	4.1	4.1	3.8	4.5
23.	3.4	3.5	3.1	3.9	3.7	3.9	3.3	3.8	3.7	4.0	3.6	3.9	4.0	4.1	3.7	4.4	4.4	3.9	3.6	4.6	4.4	4.2	4.0	4.4
24.	2.5	2.7	1.7	1.7	2.2	2.7	1.7	1.7	2.2	2.8	2.4	1.7	2.0	3.0	2.4	1.5	1.8	3.1	2.3	1.4	1.9	3.0	1.7	1.3
25.	2.3	3.0	1.7	2.5	2.4	3.4	2.5	2.9	2.3	3.4	3.0	3.1	2.3	3.7	3.1	3.5	2.0	3.6	3.0	3.3	1.9	3.9	3.2	3.2
26.	3.6	3.2	2.9	3.1	4.0	3.4	3.0	3.1	3.8	3.6	3.0	3.4	4.0	3.9	3.1	3.6	4.2	3.8	3.4	3.8	4.3	3.8	3.7	3.6
27.	3.8	3.7	3.5	4.2	4.1	4.1	3.7	4.4	4.2	4.0	3.5	4.7	4.5	4.2	3.8	4.9	4.6	4.2	3.9	4.4	4.7	4.5	4.3	4.9
28.	4.0	3.7	3.9	4.4	4.3	4.1	3.9	4.6	4.4	4.0	3.8	4.8	4.7	4.2	3.9	4.9	4.8	4.2	4.1	4.9	4.8	4.5	4.4	4.9
29.	2.8	2.2	2.0	2.1	1.9	2.7	2.4	1.9	2.9	2.5	2.2	1.8	2.8	2.4	2.0	1.6	2.1	2.2	2.3	1.7	2.2	1.8	1.8	1.5
30.	3.2	2.8	3.4	2.2	3.1	2.8	3.3	2.3	3.3	2.6	2.5	2.0	2.9	2.5	2.6	1.8	2.3	2.6	2.5	1.8	2.3	2.0	2.2	1.8

APPENDIX D.

Statistical Data for the Derivation of the Stability Coefficient Estimate in 1977.

Months March - April

Teachers	J			K			C			D			E			F			G			H		
Source of Variation																								
1. children	19	187.6	9.9	41	79.1	1.9	14	123.1	8.8	15	66.2	4.4	23	248.6	10.8	16	72.6	4.5	22	74.3	3.4	18	157.8	8.8
2. occasions	1	9.7	9.7	1	23.6	23.6	1	0.1	0.1	1	8.3	8.3	1	8.9	8.9	1	0.3	0.3	1	0.7	0.7	1	0.1	0.1
3. items	29	1044.4	36.0	29	579.9	17.9	29	347.9	12.0	29	238.9	8.2	29	898.4	31.0	29	526.7	18.2	29	812.2	28.0	29	1118.5	38.6
1x2	19	34.7	1.8	41	25.7	0.6	14	4.7	0.3	15	7.2	0.5	23	35.5	1.8	16	1.0	0.6	22	8.4	0.4	18	45.1	2.5
1x3	511	1119.3	2.0	1189	1105.4	0.9	406	659.5	1.6	435	465.4	1.1	667	915.3	1.4	464	455.1	1.0	638	399.8	0.6	522	800.6	1.5
2x3	29	89.8	3.1	29	25.7	0.9	29	18.2	0.6	29	22.0	0.8	29	19.5	0.7	29	20.0	0.7	29	15.7	0.5	29	23.2	0.8
Residual	511	510.5	0.9	1189	355.9	0.3	406	164.5	0.3	435	177.1	0.4	667	216.7	0.3	464	112.7	0.2	638	126.2	0.2	522	425.2	0.8

Months March - July

Teachers	J			K			C			D			E/L*			F			G			H		
Source of Variation																								
1. children	26	135.5	5.2	23	90.5	3.9	19	146.2	7.7	14	74.5	5.3	25	117.5	4.7	18	112.3	6.2	24	75.1	3.1	20	159.6	8.0
2. occasions	1	1.2	1.2	1	108.4	108.4	1	13.7	13.7	1	15.7	15.7	1	71.5	71.5	1	8.3	8.3	1	28.3	28.3	1	11.2	11.2
3. items	29	1560.4	53.8	29	403.2	13.9	29	755.6	26.1	29	173.6	6.0	29	545.8	18.8	29	405.3	14.0	29	1012.1	34.9	29	1303.0	44.9
1x2	26	60.9	2.3	23	18.2	0.8	19	24.2	1.3	14	25.3	1.8	25	51.2	2.1	18	9.4	0.5	24	26.8	1.1	20	38.1	1.9
1x3	754	1576.6	2.1	667	730.1	1.1	551	721.0	1.3	406	531.5	1.3	725	686.9	1.0	522	695.0	1.3	696	462.6	0.7	580	789.2	1.4
2x3	29	28.6	1.0	29	57.4	2.0	29	46.1	1.6	29	26.2	0.9	29	123.5	4.3	29	23.9	0.8	29	38.2	1.3	29	34.6	1.2
Residual	754	659.3	0.9	667	351.6	0.5	551	245.2	0.4	406	249.3	0.6	725	388.8	0.5	522	166.9	0.3	696	220.8	0.3	580	385.5	0.7

Months March - December

Teachers	J			K			C			D			E/L			F			G			H		
Source of Variation																								
1. children	29	144.6	5.0	25	56.1	2.2	16	131.7	8.2	13	31.5	2.4	24	169.8	7.1	15	75.3	5.0	21	74.1	3.5	20	164.0	8.2
	1	1.1	1.1	1	148.9	148.9	1	17.6	17.6	1	94.7	94.7	1	139.2	139.2	1	38.0	38.0	1	13.6	13.6	1	23.5	23.5
	29	1861.3	64.2	29	1038.6	35.8	29	582.1	20.1	29	345.3	11.9	29	878.8	30.5	29	775.0	26.7	29	959.0	33.1	29	1885.3	65.0
	29	64.8	2.2	25	21.4	0.9	16	28.6	1.8	13	19.2	1.5	24	62.9	2.6	15	18.0	1.3	21	29.5	1.4	20	32.7	1.6
	841	1505.1	1.8	725	513.4	0.7	464	760.9	1.6	377	501.8	1.3	696	738.5	1.1	435	408.0	0.9	609	50.2	0.8	580	681.8	1.2
	29	140.1	4.8	29	473.0	16.3	29	63.0	2.2	29	170.3	5.9	29	155.9	5.4	29	252.0	8.7	29	95.5	3.3	29	69.4	2.4
	841	783.5	0.9	725	367.7	0.5	464	276.8	0.6	377	167.9	0.5	696	378.5	0.5	435	172.6	0.4	609	225.4	0.4	580	309.4	0.5

* Teacher E transferred in April and Teacher L was her replacement

APPENDIX E.

Factor Analysis of POS Items for 1977 at Site 1

Showing All Items with Values above .5

MONTHLY FACTOR LOADINGS

		March	April	July	Aug.	Nov.	Dec.
Factor I:	Language						
Item 3:	extends upon language situations	.77	.89	.93	.88	.80	.92
Item 4:	answers questions appropriately	.75	.77	.80	.67		.85
Item 10:	makes explanations	.81	.83	.84	.77	.89	.71
Item 13:	talks about his/her treasures	.75	.72	.68	.53	.72	.58
Item 19:	asks questions	.76	.79	.80	.80	.83	.60
Item 26:	has a wide vocabulary	.77	.82	.85	.72	.66	.83
Item 17:	withdraws when approached by an adult	-.52		-.58	-.55	-.84	
Factor II:	Prosocial Behaviour v. Aggression						
Item 5:	disrupts activities	-.88	-.88	-.84	-.75	-.83	-.72
Item 14:	fights with other children	-.90	-.91	-.79	-.82	-.82	-.85
Item 24:	expresses dislike of activities	-.75	-.83	-.72	-.82	-.69	
Item 27:	waits turns & shares materials	.82	.78	.76	.73	.67	.71
Item 28:	follows classroom rules & procedures	.59		.70	.64	.73	.80
Factor III:	Need Achievement						
Item 6:	attempts routine tasks independently	.80	.67				
Item 8:	works to complete an activity	.60				.53	.85
Item 9:	expresses interest in set tasks	.69		.51	.56	.77	.61
Item 15:	participates in group activities	.73	.65		.67	.75	
Item 20:	initiates new activities without assistance	.80	.67	.56		.55	.65
Factor IV:	Anxiety						
Item 1:	becomes flustered in group situations	.59	.52		+.53		.60
Item 16:	wanders from one activity to another without completing any activity	.59	.61				
Item 23:	approaches tasks with assurance	-.73	-.75	-.58		-.77	-.53
Item 29:	makes unnecessary demands for assistance, recognition or attention	.80	.77	.50		.69	.81

APPENDIX E.

Factor Analysis of POS Items for 1977 at Site 2

Showing All Items with Values above .5

		MONTHLY FACTOR LOADINGS					
		March	April	July	Aug.	Nov.	Dec.
Factor I:	Language & Need Achievement v. Anxiety						
Item 1:	becomes flustered in group situations		−.55	−.65	−.61	−.70	−.59
Item 3:	extends upon language situations	.89	.81	.72	.76	.89	.79
Item 4:	answers questions appropriately	.83		.72	.68	.87	.81
Item 6:	attempts routine tasks independently	.62	.72	.63	.79	.56	.68
Item 8:	works to complete an activity	.55	.68		.74	.68	.73
Item 10:	makes explanations	.70		.72	.79	.87	.83
Item 11:	plans and prepares for a task		.76		.66	.81	.77
Item 13:	talks about his/her treasures	.66		.77			
Item 16:	wanders from one activity to another without completing any activity	−.56	−.64		−.67	−.62	−.63
Item 26:	has a wide vocabulary	.69	.71	.71	.79	.93	.91
Item 19:	asks questions	.67	.82	.75	.74	.73	.56
Item 30:	needs reassurance when attempting tasks		−.78		−.65	−.60	−.70
Item 20:	initiates new activities without assistance		.65	.55	.64	.76	.86
Item 23:	approaches tasks with assurance		.65	.79	.88	.76	.73
Factor II:	Prosocial Behaviours v. Aggression						
Item 5:	disrupts activities	−.81	−.78	−.79	−.90	−.85	−.81
Item 14:	fights with other children	−.93	−.88	−.85	−.84	−.83	−.84
Item 24:	expresses dislike of activities	−.70		−.50	−.66		
Item 27:	waits turns & shares materials	+.87	.85	.84	.84	.36	.90
Item 28:	follows classroom rules & procedures	+.79	.83	.83	.84	.85	.91

APPENDIX E.

Factor Analysis of POS Items for 1977 at Site 3

Showing All Items with Values above .5

MONTHLY FACTOR LOADINGS

	March	April	July	Aug.	Nov.	Dec.
Factor I: Language						
Item 3: extends upon language situations	.90	.88	.87	.86	.90	.89
Item 4: answers questions appropriately	.82	.88	.86	.55	.67	.82
Item 10: makes explanations	.86	.91	.85	.79	.79	.84
Item 13: talks about his/her treasures		.69	.79	.53	.79	.60
Item 19: asks questions	.79	.86	.75	.69	.80	.79
Item 26: has a wide vocabulary	.87	.90	.85	.87	.80	.84
Factor II: Prosocial Behaviour v. Aggression						
Item 5: disrupts activities	-.73	-.82	-.52	-.78	-.82	-.83
Item 14: fights with other children	-.74	-.77	-.74	-.71	-.88	-.89
Item 24: expresses dislike of activities	-.71		-.65		-.69	-.51
Item 27: waits turns & shares materials	.74	.79	.59	.79	.72	.68
Item 28: follows classroom rules & procedures	.58	.60	.51	.78	.73	.68
Factor III: need-Achievement v. Anxiety						
Item 6 attempts routine tasks independently	.68	.76			.52	
Item 8: works to complete an acitivity	.76	.67	.75	.77	.55	.83
Item 9: expresses interes in set tasks	.60	.68	.58	.54		.75
Item 11: plans & prepares for a task	.73	.81	.73	.65		.66
Item 16: wanders from one activity to another without completing any activity	-.79	-.76	-.78	-.74	-.57	-.73
Item 23: approaches tasks with assurance	.60	.53	.69	.51	.71	
Item 30: needs reassurance when attempting tasks	-.70	-.80	-.61		-.59	

APPENDIX E.

Factor Analysis of POS Items for 1977 at Site 4

Showing All Items with Values above .5

		MONTHLY FACTOR LOADINGS					
		March	April	July	Aug.	Nov.	Dec.
Factor I:	Language & Need Achievement v. Anxiety.						
Item 1:	becomes flustered in group situations	-.76	-.86		-.69		-.73
Item 3:	extends upon language situations	.65	.89		.67	.52	.69
Item 4:	answers questions appropriately	.72	.67	.66	.74	.50	.71
Item 6:	attempts routine tasks independently	.74	.51	.73		.69	.81
Item 8:	works to complete an activity		.50	.73	.57	.74	
Item 9:	expresses interest in set tasks		.58	.67	.64	.61	.63
Item 10:	makes explanations	.59	.80	.57	.62	.69	.81
Item 13:	talks about his/her treasures		.83		.80		.63
Item 15:	participates in groups activities	.68	.75		.62	.61	
Item 19:	asks questions	.65	.75		.82		.72
Item 20:	initiates new activities without assistance	.74	.68	.58	.65	.82	
Item 22:	initiates interaction with other children	.74	.76		.81		
Item 23:	approaches tasks with assurance	.90	.84		.77	.65	
Item 26	has a wide vocabulary	.64	.77	.52	.61	.63	.70
Item 30:	needs reassurance when attempting tasks	-.84	-.86		-.51	-.70	-.74
Factor II:	Prosocial Behaviour v. Aggression						
Item 5:	disrupts activities	-.60	-.56		-.78		-.83
Item 14:	fights with other children	-.66	-.56	-.74	-.86	-.74	-.60
Item 24:	expresses dislike of activities		-.77	-.65	-.86	-.60	-.80
Item 27:	waits turns & shares materials	.81	.69		.75		.72
Item 28:	follows classroom rules & procedures	.64	.86	.51	.74		.68

APPENDIX F: STATISTICAL DATA FOR THE DERIVATION OF THE INTER-RATER RELIABILITY ESTIMATES, 1976

Month	AUGUST											
Site	1			2			3			4		
Source of Variation	df	SS	MS	df	SS	MS	df	SS	MS	df	SS	MS
1. children	21	205.09	9.77	22	158.83	7.22	26	125.98	4.85	26	113.64	4.37
2. teachers	1	15.71	15.71	1	19.02	19.02	1	2.69	2.69	1	6.68	6.68
3. items	29	535.02	18.45	29	432.41	14.91	29	456.40	15.74	29	1181.46	40.74
1 x 2	21	45.45	2.16	22	32.05	1.46	26	14.88	0.57	26	27.79	1.07
1 x 3	609	1499.18	2.46	638	879.26	1.38	754	690.83	0.92	754	728.54	0.97
2 x 3	29	78.66	2.71	29	50.03	1.73	29	46.31	1.60	29	191.10	6.59
Residual	609	545.21	0.90	638	278.90	0.44	754	273.12	754	754	471.43	0.63
TOTAL	1319	2924.28		1379	1850.49		1619	1610.21		1619	2720.64	

Month	NOVEMBER											
Site	1			2			3			4		
Source of Variation	df	SS	MS	df	SS	MS	df	SS	MS	df	SS	MS
1. children	23	197.52	8.59	21	99.36	4.73	25	160.20	6.41	22	122.30	5.56
2. teachers	1	4.67	4.67	1	1.75	1.75	1	0.62	0.62	1	2.35	2.35
3. items	29	981.29	33.84	29	407.33	14.05	29	677.35	23.36	29	1166.46	40.22
1 x 2	23	42.46	1.85	21	32.16	1.53	25	21.53	0.86	22	19.16	0.87
1 x 3	667	1644.31	2.47	609	764.50	1.26	725	744.93	1.03	638	771.52	1.21
2 x 3	29	86.08	2.97	29	46.21	1.59	29	73.29	2.53	29	158.71	5.47
Residual	667	683.78	1.03	609	249.89	0.41	725	251.06	0.35	638	357.26	0.56
TOTAL	1439	3640.11		1319	1601.20		1559	1928.98		1379	2597.77	

Month	DECEMBER											
Site	1			2			3			4		
Source of Variation	df	SS	MS	df	SS	MS	df	SS	MS	df	SS	MS
1. children	21	73.40	3.49	21	72.65	3.46	23	169.37	7.36	20	175.66	8.78
2. teachers	1	46.59	46.59	1	0.27	0.27	1	5.26	5.26	1	0.16	0.16
3. items	29	1616.44	55.74	29	1082.46	37.33	29	900.20	31.04	29	1360.49	46.91
1 x 2	21	33.43	1.59	21	34.11	1.62	23	20.33	0.88	20	26.78	1.34
1 x 3	609	1296.65	2.13	609	736.32	1.21	667	761.65	1.14	580	675.57	1.17
2 x 3	29	198.36	6.84	29	60.98	2.10	29	168.45	5.82	29	133.65	4.61
Residual	609	419.60	0.69	609	337.14	0.55	667	280.27	0.42	580	333.41	0.58
TOTAL	1319	3684.38		1319	2323.93		1439	2305.71		1259	2705.72	

APPENDIX G: STATISTICAL DATA FOR THE DERIVATION OF THE STABILITY COEFFICIENT, 1976

PRESENTED IN TABLE 4

	Site 1. Teacher 11			Site 1 Teacher 22			Site 2 Teacher 06			Site 2 Teacher 09		
Source of Variation	df	SS	MS	df	SS	MS	df	SS	MS	df	SS	MS
1. children	20	142.02	7.10	20	180.05	9.00	17	110.11	6.48	25	147.20	5.91
2. occasions	1	5.08	5.08	1	96.66	96.67	1	3.56	3.56	1	0.00	0.00
3. items	29	1236.46	42.64	29	537.05	18.52	29	583.52	20.12	29	831.23	28.66
1 x 2	20	72.29	3.61	20	19.32	0.97	17	18.64	1.10	25	47.56	1.90
1 x 3	580	1494.50	2.58	580	1242.33	2.14	493	569.61	1.16	725	1078.07	1.49
2 x 3	29	83.64	2.89	29	289.64	9.99	29	35.94	1.24	29	53.69	1.85
Residual	580	423.95	0.73	580	406.87	0.71	493	215.86	0.44	725	343.74	0.47
TOTAL	1259	3457.98		1259	2771.92		1079	1537.24		1559	2501.99	

	Site 3, Teacher 15			Site 3 Teacher 16			Site 4 Teacher 04			Site 4 Teacher 23		
Source of Variation	df	SS	MS	df	SS	MS	df	SS	MS	df	SS	MS
1. children	29	144.19	4.97	35	164.59	4.70	34	144.05	4.24	25	138.21	5.53
2. occasions	1	56.89	56.89	1	7.00	7.00	1	0.00	0.00	1	2.79	2.79
3. items	29	843.02	29.07	29	1014.43	34.98	29	1267.87	43.72	29	2382.41	82.15
1 x 2	29	38.98	1.34	35	26.61	0.76	34	19.62	0.58	25	49.77	1.99
1 x 3	841	820.51	0.98	1015	1093.91	1.08	986	941.41	0.95	725	877.75	1.21
2 x 3	29	88.41	3.05	29	104.26	3.60	29	113.07	3.90	29	59.79	2.06
Residual	841	366.65	0.44	1015	329.61	0.33	986	358.80	0.36	725	530.64	0.73
TOTAL	1799	2358.71		2159	2740.43		2099	2944.81		1559	4041.36	

APPENDIX H: STATISTICAL DATA FOR THE DERIVATION OF THE INTER-RATER RELIABILITY COEFFICIENT ESTIMATES, 1977

Month	MARCH											
Site		1			2			3			4	
Source of Variation	df	S	MS	df	SS	MS	df	SS	MS	df	SS	MS
1. children	26	102.3	3.9	17	102.2	6.5	21	105.5	5.0	16	99.9	6.2
2. teachers	1	53.7	53.7	1	8.0	8.0	1	1.7	1.7	1	1.8	1.8
3 items	29	662.1	22.8	29	255.4	8.8	29	493.0	17.0	29	708.0	24.4
1 x 2	26	21.5	0.8	17	16.7	1.0	21	23.0	1.1	16	25.9	1.6
1 x 3	754	1105.5	1.5	493	683.1	1.4	609	827.2	1.4	464	530.6	1.1
2 x 3	29	159.9	5.5	29	50.7	1.8	29	85.4	2.9	29	80.3	2.8
Residual	754	559.4	0.7	493	243.1	0.5	609	232.4	0.4	464	245.5	0.5
TOTAL												

Month	APRIL											
Site		1			2			3			4	
Source of Variation	df	SS	MS	df	SS	MS	df	SS	MS	df	SS	MS
1. children	24	119.1	5.0	16	69.5	4.4	25	200.0	8.0	18	61.0	3.4
2. teachers	1	41.0	41.0	1	7.8	7.8	1	0.1	0.1	1	3.7	3.7
3. items	29	802.2	27.7	29	377.7	13.0	29	695.8	24.0	29	1105.9	38.1
1 x 2	24	17.8	0.7	16	18.4	1.2	25	31.9	1.3	18	19.8	1.1
1 x 3	696	850.1	1.2	464	531.3	1.2	725	822.7	1.1	522	381.6	0.7
2 x 3	29	264.4	9.1	29	111.7	3.9	29	149.9	5.2	29	156.7	5.4
Residual	696	390.8	0.6	464	214.7	0.5	725	317.1	0.4	522	230.3	0.4
TOTAL												

Month	JULY											
Site		1			2			3			4	
Source of Variation	df	SS	MS	df	SS	MS	df	SS	MS	df	SS	MS
1. children	21	55.6	2.7	17	144.9	8.5	21	114.3	5.4	24	136.9	5.7
2. teachers	1	3.0	3.0	1	1.5	1.5	1	14.6	14.6	1	3.4	3.4
3. items	29	902.5	31.1	29	286.6	9.9	29	362.8	12.5	29	1655.7	57.1
1 x 2	21	38.3	1.8	17	33.1	2.0	21	11.7	0.6	24	35.1	1.5
1 x 3	609	920.2	1.5	493	742.9	1.5	609	723.7	1.2	696	663.0	1.0
2 x 3	29	69.3	2.4	29	81.8	2.8	29	32.8	1.1	29	89.4	3.1
Residual	609	421.9	0.7	493	281.6	0.6	609	240.3	0.4	696	309.6	0.5
TOTAL												

APPENDIX H: STATISTICAL DATA FOR THE DERIVATION OF THE INTER-RATER RELIABILITY COEFFICIENT ESTIMATES, 1977

Month: AUGUST	Site 1			Site 2			Site 3			Site 4		
Source of Variation	df	SS	MS	df	SS	MS	df	SS	MS	df	SS	MS
1. children	25	122.4	4.9	19	165.4	8.7	25	64.8	2.6	17	99.4	5.9
2. teachers	1	7.9	7.9	1	1.0	1.0	1	102.1	102.1	1	3.3	3.3
3. items	29	1178.5	40.6	29	668.2	23.0	29	697.7	24.1	29	1285.9	44.3
1 x 2	25	19.7	0.8	19	42.7	2.3	25	19.4	0.8	17	17.2	1.0
1 x 3	725	1107.0	1.5	551	887.1	1.6	725	635.9	0.9	493	329.1	0.7
2 x 3	29	120.9	4.2	29	87.7	3.0	29	59.2	2.0	29	121.1	4.2
Residual	725	489.9	0.7	551	313.1	0.6	725	260.8	0.4	493	190.4	0.4
TOTAL												

Month: NOVEMBER	Site 1			Site 2			Site 3			Site 4		
Source of Variation	df	SS	MS	df	SS	MS	df	SS	MS	df	SS	MS
1. children	20	69.0	3.5	13	90.3	6.9	24	109.0	4.5	20	75.0	3.8
2. teachers	1	15.8	15.8	1	1.6	1.6	1	31.1	31.1	1	16.7	16.7
3. items	29	1854.1	63.9	29	523.8	18.1	29	778.8	26.9	29	1700.0	58.6
1 x 2	20	24.3	1.2	13	8.3	0.6	24	14.0	0.6	20	21.9	1.1
1 x 3	580	793.3	1.4	377	679.9	1.8	696	715.2	1.0	580	411.6	0.7
2 x 3	29	88.1	3.0	29	49.9	1.7	29	106.9	3.7	29	81.2	2.8
Residual	580	398.3	0.7	377	145.6	0.4	696	262.0	0.4	580	205.7	0.4
TOTAL												

Month: DECEMBER	Site 1			Site 2			Site 3			Site 4		
Source of Variation	df	SS	MS	df	SS	MS	df	SS	MS	df	SS	MS
1. children	22	64.4	2.9	15	77.5	5.2	21	91.7	4.4	20	151.4	7.6
2. teachers	1	22.5	22.5	1	6.3	6.3	1	15.9	15.9	1	0.1	0.1
3. items	29	1980.8	68.3	29	512.8	17.7	29	1339.5	46.2	29	1661.4	57.3
1 x 2	22	40.5	1.8	15	14.1	0.9	21	16.4	0.8	20	19.9	1.0
1 x 3	638	1032.8	1.6	435	776.1	1.8	609	611.4	1.0	580	668.7	1.2
2 x 3	29	50.8	1.8	29	47.9	1.7	29	153.6	5.3	29	102.2	3.5
Residual	638	370.3	0.6	435	215.7	0.5	609	239.7	0.4	580	257.4	0.4
TOTAL												

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APPENDIX I: STATISTICAL DATA FOR THE DERIVATION OF THE INTER-RATER RELIABILITY COEFFICIENT ESTIMATES, 1977 INVOLVING FOUR RATERS

Month	APRIL											
Site	1			2			3			4		
Source of Variation	df	SS	MS	df	SS	MS	df	SS	MS	df	SS	MS
1. children	24	403.3	16.8	16	141.4	8.8	15	84.3	5.6	16	90.6	5.7
2. teachers	3	127.0	42.3	3	99.1	33.0	3	105.9	35.3	3	38.0	12.7
3. items	29	1146.7	39.5	29	1052.0	36.3	29	918.8	31.7	29	1077.5	37.2
1 x 2	72	147.1	2.0	48	73.2	1.5	45	138.0	3.1	48	59.9	1.3
1 x 3	696	1497.4	2.2	464	977.3	2.1	435	655.8	1.5	464	481.1	1.0
2 x 3	87	537.0	6.2	87	343.8	4.0	87	208.4	2.4	87	398.5	4.6
Residual	2088	1238.4	0.6	1392	866.5	0.6	1305	714.0	0.6	1392	660.6	0.5
TOTAL												

Month	AUGUST											
Site	1			2			3			4		
Source of Variation	df	SS	MS	df	SS	MS	df	SS	MS	df	SS	MS
1. children	25	369.2	14.8	19	344.4	18.1	25	233.3	9.3	17	186.7	11.0
2. teachers	3	57.5	19.2	3	243.8	81.3	3	224.3	74.8	3	35.5	11.8
3. items	29	1989.1	68.6	29	1304.3	45.0	29	1649.3	56.9	29	1465.5	50.5
1 x 2	75	90.5	1.2	57	109.6	1.9	75	113.0	1.5	51	68.8	1.4
1 x 3	725	1917.1	2.6	551	1340.0	2.4	725	1355.6	1.9	493	569.0	1.2
2 x 3	87	500.0	5.8	87	288.1	3.3	87	245.4	2.8	87	342.6	3.9
Residual	2175	1435.2	0.7	1653	1093.5	0.7	2175	1126.9	0.5	1479	521.9	0.4
TOTAL												

Month	DECEMBER											
Site	1			2			3			4		
Source of Variation	df	SS	MS	df	SS	MS	df	SS	MS	df	SS	MS
1. children	22	168.1	7.6	15	153.6	10.2	21	232.0	11.1	20	256.4	12.8
2. teachers	3	35.1	11.7	3	78.8	26.3	3	95.6	31.9	3	2.9	1.0
3. items	29	3382.0	116.6	29	1015.0	35.0	29	1890.0	65.2	29	1915.0	66.0
1 x 2	66	148.2	2.3	45	74.3	1.7	63	61.8	1.0	60	63.1	1.1
1 x 3	638	1850.4	2.9	435	1086.1	2.5	609	1367.8	2.3	580	1000.0	1.7
2 x 3	87	329.9	3.8	87	226.0	2.6	87	407.7	4.7	87	431.5	5.0
Residual	1914	1131.6	0.6	1305	817.6	0.6	1827	943.4	0.5	1740	661.0	0.4
TOTAL												